



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/692,883

10/25/2003

Jason M. Chilcote

H0004596

1908

7590

02/18/2005

Kris T. Fredrick  
Honeywell International, Inc.  
101 Columbia Rd.  
P.O. Box 2245  
Morristown, NJ 07962

EXAMINER

WHITTINGTON, KENNETH

ART UNIT

PAPER NUMBER

2862

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

HA

<b>Office Action Summary</b>	<b>Application No.</b> 10/692,883	<b>Applicant(s)</b> CHILCOTE ET AL.	
	<b>Examiner</b> Kenneth J Whittington	<b>Art Unit</b> 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

Art Unit: 2862

**DETAILED ACTION*****Specification***

Applicant is reminded of the proper language and format for an abstract of the disclosure.

5

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

15

The language should be clear and concise and should not repeat information given in the title.. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

20

The abstract of the disclosure is objected to because on line 1, it contains terms that can be implied, i.e., "is disclosed". Correction is required. See MPEP § 608.01(b).

25

***Claim Objections***

Claims 2, 3 and 13 are objected to because of the following informalities:

30

"said interfacing circuit" in claims 2 and 3 lacks antecedent basis;

"said target" in claim 13 lacks antecedent basis.

Appropriate correction is required.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs  
5 of 35 U.S.C. 102 that form the basis for the rejections under  
this section made in this Office action:

A person shall be entitled to a patent unless -

10 (b) the invention was patented or described in a printed publication in this or  
a foreign country or in public use or on sale in this country, more than one  
year prior to the date of application for patent in the United States.

Claims 1, 2, 5-7, 9, 13, 14 and 17-19 are rejected under 35  
U.S.C. 102(b) as being anticipated by Ramsden (Sensor  
15 Applications for Magnetic Materials). Regarding claims 1, 6, 13  
and 18, Ramsden discloses a magnetic sensor comprising a  
ferromagnetic runner located relative to a target (See Ramsden  
page 4, FIG. 8, note ferrous core and the magnetic field applied  
to sensor would be provided by a target), and

20 a coil structure wound about the ferromagnetic runner (See  
same figure of Ramsden), such that when a magnetic field changes  
direction along an axial length of the runner, voltage is  
induced in the coil proportional to a time change of the  
magnetic flux thereof. This is based upon Faraday's Law which  
25 states that

$$\text{Emf} = V = -[\{\text{change in flux}\}/\{\text{change in time}\}],$$

Art Unit: 2862

when the area to which the magnetic field is applied is constant:

$$V = -\text{Area} * [\{\text{magnetic field change}\} / \{\text{change in time}\}]$$

and for an inductor with N number of turns, this equation

5 becomes

$$V = -N * \text{Area} * [\{\text{magnetic field change}\} / \{\text{change in time}\}].$$

Regarding claims 2 and 14, Ramsden discloses the coil structure wound tightly about the ferromagnetic runner such that the structure possesses a number of turns (See Ramsden FIG. 8).

10 The remaining recitations of the claims are properties relating to the number of turns of any inductor having the recited structure. Since Ramsden's device discloses the structure, it has the properties.

Regarding claims 5, 7 and 17, Ramsden discloses that the  
15 soft magnetic material in the inductor of FIG. 8 is a permalloy, which has the property of being magneto-resistive material (See Ramsden page 3 and present specification on page 2, paragraph 006).

Regarding claims 9 and 19, because Ramsden discloses the  
20 structures of claims 1 and 13 as noted above, it has the properties outlined in claims 9 and 19 in view of the recitation of Faraday's Law noted above.

Art Unit: 2862

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

5 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at  
10 the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere* Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for  
15 establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
- 20 3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

25 Claims 3, 4, 8, 10-12, 15, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramsden in view of Dezuari et al. (Development of a Novel Printed Circuit Board Technology of Inductive Device Applications). Regarding claims  
30 claims 1 and 13 as discussed above. However, Ramsden does not explicitly disclose a manufacturing method of the coil design.

Art Unit: 2862

Dezuari et al. teaches methods for interconnecting metals or semiconductor layers located beneath the runner and insulating metal both of which are used to create an interface circuit which integrates the runner and the coil (See Dezuari et al. page 2, 2.2 Fabrication process and note figures). It would have been obvious to a person having ordinary skill in the art to apply the fabrication process disclosed in Dezuari et al. to the sensor disclosed in Ramsden. One having ordinary skill in the art would have been motivated to do so to increase the miniaturization of such inductive devices (See Dezuari et al. page 1, note Introduction).

Regarding claims 10 and 11, Ramsden teaches a magnetic sensor comprising a ferromagnetic runner located relative to a target (See Ramsden page 4, FIG. 8, note ferrous core and the magnetic field applied to sensor would be provided by a target), and a coil structure wound about the ferromagnetic runner (See same figure of Ramsden), such that when a magnetic field changes direction along an axial length of the runner, voltage is induced in the coil proportional to a time change of the magnetic flux thereof. This is based upon Faraday's Law which states that

$$\text{Emf} = V = -[\{\text{change in flux}\}/\{\text{change in time}\}],$$

Art Unit: 2862

when the area to which the magnetic field is applied is constant:

$$V = -\text{Area} * \left[ \frac{\{\text{magnetic field change}\}}{\{\text{change in time}\}} \right]$$

and for an inductor with N number of turns, this equation

5 becomes

$$V = -N * \text{Area} * \left[ \frac{\{\text{magnetic field change}\}}{\{\text{change in time}\}} \right].$$

Ramsden further teaches the coil structure wound tightly about the ferromagnetic runner such that the structure possesses a number of turns (See Ramsden FIG. 8), which has the property  
10 wherein it achieves a voltage spike amplitude when a magnetic field changes direction along the axial length of the runner.

However, Ramsden does not explicitly disclose a manufacturing method of the coil design. Dezuari et al. teaches methods for interconnecting metals or semiconductor layers  
15 located beneath the runner and insulating metal both of which are used to create an interface circuit which integrates the runner and the coil (See Dezuari et al. page 2, 2.2 Fabrication process and note figures). It would have been obvious to a person having ordinary skill in the art to apply the fabrication  
20 process disclosed in Dezuari et al. to the sensor disclosed in Ramsden. One having ordinary skill in the art would have been motivated to do so to increase the miniaturization of such



Art Unit: 2862

inductive devices (See Dezuari et al. page 1, note Introduction).

Regarding claim 12, because Ramsden disclose the structures of claim 10 as noted above, it has the properties outlined in  
5 claims 9 and 19 in view of the recitation of Faraday's Law noted above.

### **Conclusion**

The prior art made of record and not relied upon is  
10 considered pertinent to applicant's disclosure. Takayama et al. (US 6,650,112) teaches of a thin film magnetic sensor. Caruso et al. (A New Perspective on Magnetic Field Sensing) teaches a background of magnetic sensors and includes a discussion of Faraday's Law. Uemura (US 5,252,919), Sugisaki et al. (US  
15 4,006,408) and Nekado (US 6,373,239) teach various linear, rotary and proximity position detection systems using a coil and permalloy core. Choi et al. (US 6,411,086), Dinsmore et al. (US 5,432,445) and Long et al. (US 4,305,034) teach fluxgate sensors using coils wound on permalloy cores. Bushida et al. (US  
20 6,154,028) teaches a miniature magnetic sensor.

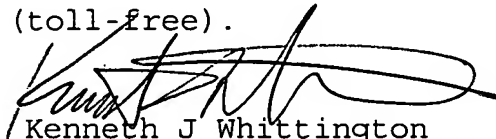
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J Whittington whose telephone number is (571) 272-2264. The

Art Unit: 2862

examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Kenneth J Whittington  
Examiner  
Art Unit 2862

kjw

  
JAY PATIDAR  
PRIMARY EXAMINER